8 7 6 5 4 3 2 NEXT ASS'Y: 1 FINAL ASS'Y:

DIAGRAMS

Symbol	Description
XXX/XXX, XXX	AIR POWER TYPE, THERMAL-MAGNETIC CIRCUIT BREAKER DRAW OUT TYPE-THREE POLE UNLESS OTHERWISE INDICATED. XXX INDICATES FRAME SIZE. TOP OR SINGLE NUMBER INDICATES FRAME SIZE. BOTTOM NUMBER INDICATES TRIP SIZE.
XAF/YAT	MOLDED CASE CIRCUIT BREAKER FIXED MOUNTED; X=FRAME SIZE Y = TRIP AMPERES; 3P UON.
TXX	POWER TRANSFORMER. TXX INDICATES TRANSFORMER NUMBER. RATINGS AS SHOWN.
TXX	ELECTROSTATIC SHIELD ISOLATION TRANSFORMER. TXX INDICATES TRANSFORMER NUMBER. RATINGS AS SHOWN.
X, V	CIRCUIT BREAKER-DRAW OUT. X-INDICATES VOLTAGE CLASS. 52-MEDIUM VOLTAGE, 15 KV V - INDICATES VACUUM BREAKER
	FUSE
	CONTACTOR (CONTACT OPEN IN THE NON ENERGIZED POSITION)
	FUSED, LOAD INTERRUPTER TYPE SWITCH
	DISCONNECT SWITCH, VOLTAGE AS REQUIRED
	DUPLEX, LOADBREAK SWITCHES, VOLT AS REQUIRED.
	GROUND CONNECTION
SA	SURGE ARRESTOR
	BUS DUCT, SIZE AS INDICATED
	DELTA-SOLIDLY GROUNDED WYE TRANSFORMER CONNECTION
	DELTA - HIGH IMPEDANCE GROUNDED WYE TRANSFORMER CONNECTION
	ENCLOSED CIRCUIT BREAKER
VFD	VARIABLE FREQUENCY DRIVE
	CAPACITOR
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	THERMAL OVERLOAD.
XXX:5, 3	CURRENT TRANSFORMER, NUMBER INDICATED, RATIO SHOWN CT - CURRENT TRANSFORMER
XXX/120, 3	POTENTIAL TRANSFORMER, NUMBER INDICATED CPT=CONTROL POWER TRANSFORMER RATIO SHOWN
M	MOTOR
M, G	MOTOR-GENERATOR SET
	BATTERIES
X	RELAYS AND INSTRUMENTS A - AMMETER V - VOLTMETER AS - AMMETER SWITCH VS - VOLTMETER SWITCH E - 120V POWER CONTOL RELAY GF - GROUND FAULT PROTECTION RELAY KWHM - (KILO) WATT-HOUR METER 86 LOCK OUT RELAY 27 UNDERVOLTAGE RELAY 50G INSTANTANEOUS OVERCURRENT GROUND RELAY 50/51 INSTANTANEOUS OVERCURRENT/AC TIME OVERCURRENT RELAY 26 LIQUID THERMAL DEVICE RELAY 49 WINDING THERMAL DEVICE RELAY 51N TIME DELAY OVERCURENT RELAY 63 SUDDEN PRESSURE RELAY 71 LIQUID LEVEL DEVICE RELAY
PTU	PROGRAMMABLE TRIP UNIT
BIM	BREAKER INTERFACE MODULE
MA&P	METER ANALYZER AND PROTECTION DEVICE
SPD	SINGLE PHASE DETECTOR (27)
K	KEY INTERLOCK SYSTEM
M	MOTOR OPERATED SWITCH
G	DIESEL GENERATOR
	AUTOMATIC TRANSFER SWITCH
M	ENERGY MONITORING DEVICE N001
F	VFD OUTPUT LINE FILTER N002

PLAN DRAWINGS

Symbol	Description
NEUTRAL, PHASE, GROUND, ISOL. GND., #10, RS-1L1-1,3,5	HOMERUN, LETTER/NUMBER DESIGNATION INDICATES PANEL AND CIRCUIT WHERE RACEWAY WILL BE TERMINATED. "SLASH" MARKS INDICATE THE NUMBER OF CONDUCTORS IF MORE THAN TWO. NUMBER INDICATES CONDUCTOR SIZE IF OTHER THAN #12 AWG. PROVIDE #12 EQUIPMENT GROUND CONDUCTOR, EVEN THOUGH NOT INDICATED. CONDUIT SIZE IS 3/4"C, UON.
1"C-3 #6, 1 #8G	CONDUIT 3/4" UON & WIRE SIZE DESIGNATION AS SHOWN: 1" CONDUIT 3 #6 PHASE CONDUCTORS, GROUND CONDUCTORS, SIZE PER NEC. IF NO DESIGNATION SHOWN, IT IS 3/4"C, 2 #12 AND 1 #12G
	CONDUIT EXPOSED
	CONDUIT CONCEALED IN FLOOR SLAB, UNDERSLAB, OR BELOW GRADE
	CONDUIT CAPPED
	CONDUIT STUBBED UP
	CONDUIT STUBBED DOWN
	CONDUIT CHANGE IN ELEVATION WITH UPPER PART AT LEFT AND LOWER PART AT RIGHT
E	ELECTRICAL UG DUCTBANK
T	TELEPHONE/COMMUNICATION UG DUCTBANK
WD	SURFACE MOUNTED RACEWAY WITH DEVICES AS SHOWN
BD-Z	BUSWAY Z= # TYPE OF BUSWAY
F, OR CIRCUIT BREAKER	BUSWAY (PLUG-IN TYPE) WITH TAP OFF UNIT AND BUS DUCT END TAP CABLE BOX
BD, A B C N G	BUSWAY (FEEDER TYPE) , LETTER INDICATES PHASE CONDUCTOR
	ELECTRICAL OR TELEPHONE HANDHOLE, AS INDICATED. PROVIDE TRAFFIC RATED COVER.
	PUSHBUTTON CONTROL, WALL MOUNT, FLUSH IN FINISHED AREAS, +48" AFF
X	NON-FUSED DISCONNECT SWITCH, MOTOR RATED, X=SWITCH AMPERES; 600V, 3P UON. MOUNT +60" AFF, UON.
F, X, Y FU	FUSED DISCONNECT SWITCH; X= SWITCH AMPERES; Y= FUSE SIZE, 600V, 3P UON, MOUNT +60" AFF UON.
1	MAGNETIC MOTOR STARTER WITH OVERLOAD, 3 POLE, 600V,NEMA SIZED AS INDICATED, PUSHBUTTON TYPE, WALL MOUNTED, 60" AFF, UON.
FUSE, STARTER, 15-1	MCP, COMBINATION STARTER AND NEMA STARTER SIZE NOTED. PROVIDE WITH OVERLOADS.
5APP1	EQUIP. TAG
	PANELBOARD SURFACE MOUNTED, 120/208V
	DISTRIBUTION/SWGR - GROUP MOUNTED FEEDERS, FLOOR, 480V/277V
	PANELBOARD SURFACE MOUNTED, 277/480V
M	ENERGY METER MODULE
T TXX	TRANSFORMER, TXX INDICATES XFMR NUMBER
$Pa	SINGLE POLE TOGGLE SWITCH, MOUNT +48" AFF, 20 AMP, 277 VOLT. P = W/PILOT LAMP, SUBSCRIPT LETTERS DENOTE SWITCHING CIRCUIT, FOR MULTIPLE LETTERS PROVIDE ONE SWITCH FOR EACH LETTER
$3a	THREE WAY TOGGLE SWITCH, MOUNT +48" AFF, 20 AMP, 277 VOLT. SUBSCRIPT LETTERS DENOTE SWITCHING CIRCUIT, FOR MULTIPLE LETTERS PROVIDE ONE SWITCH FOR EACH LETTER
$	SINGLE POLE TOGGLE SWITCH, MOUNT +48" AFF, 20 AMP, 277 VOLT
$4	FOUR WAY TOGGLE SWITCH, MOUNT +48" AFF, 20 AMP, 277 VOLT
$D	DIMMER SWITCH, MOUNT +48" AFF, 277 VOLT.
$M	MANUAL MOTOR START.
	DUPLEX CONVENIENCE RECEPTACLE, 20A, 125V, NEMA 5-20R, 18" AFF WP=WEATHERPROOF, CT=LOCATE AT COUNTERTOP LEVEL, COORDINATE WITH COUNTERTOP PLACEMRNT GFI = GROUND FAULT INTERRUPT
	4-PLEX CONVENIENCE RECEPTACLE, 20A, 125V, NEMA 5-20R, 18" AFF GFI = GROUND FAULT INTERRUPT, WP = WEATHERPROOF
	DUPLEX CONVENIENCE RECEPTACLE, 20A, 125V, NEMA 5-20R, FLOOR MOUNT UON.
	DUPLEX CONVENIENCE RECEPTACLE, 20A, 125V, NEMA 5-20R, 18" AFF WITH GROUND FAULT INTERRUPT, WP = WEATHERPROOF.
	SINGLE TWIST LOCK RECEPTACLE, 20A, 2P, 3W, 125V, NEMA L5-20R, 18" AFF
	TWIST-LOCK RECEPTACLE, 2P, 3W GROUNDING, 20A, 250V., 18" AFF.
	SINGLE TWIST LOCK RECEPTACLE, 30A, 125V, NEMA L5-30R, 18" AFF
	PIN AND SLEEVE UNFUSED MECHANICAL INTERLOCK RECEPTACLE, 30A, 3P, 4W, 3ø, 250V. HUBBEL 430M19W, 24" AFF.
	TWIST-LOCK RECEPTACLE, 3 POLE, 4 WIRE GROUNDING, 60A, 3P, 4W, 3ø, 600V. HUBBEL 26410 IN ANGLE HOUSING 26404, 4'-6" AFF. UON.
	TWIST-LOCK RECEPTACLE, 3P, 4W GROUNDING, 20A, 3ø, 480V., 18" AFF.
J	CEILING AND WALL MOUNTED JUNCTION BOX
Mxx	ELECTRICAL MANHOLE XX INDICATES MANHOLE No.
Hxx	ELECTRICAL HAND HOLE XX INDICATES HAND HOLE No.
Pxx	ELECTRICAL PULLBOX XX INDICATES PULLBOX No.
CN-01	DENOTED AS FEEDER SCHEDULE TAG NUMBER, CN INDICATES BUILDING NAME.
XXX A BUS	13.3KV-BUS DUCT, XXX INDICATES AMP RATING
1	ELECTRICAL CABLE TRAY, THE NUMBER "1" INDICATES CONDUIT ENTERING TOP TRAY.
	TRAY TRANSITION
XXX	'XXX' DENOTES IDENTIFICATION. CABLE TRAY SYSTEM.
	CABLE TRAY UP OR DOWN

FIRE ALARM

Symbol	Description
A	FIRE ANNUNCIATON AND ALARM STROBE LIGHT.
FCP OR FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUNCIATOR PANEL
FPC	FIRE PUMP CONTROLLER
SD	SMOKE DETECTOR
HD	HEAT DETECTOR
DD	DUCT TYPE SMOKE DETECTOR
F	AUDIBLE/VISUAL NOTIFICATION DEVICE
F	MANUAL PULL STATION
ID	_ DETECTOR
GD	GAS DETECTOR
MM	MONITOR MODULE

COMMUNICATION, LIFE SAFETY & SECURITY

Symbol	Description
W	TELEPHONE OUTLET BOX, WALL MOUNT, FOR WALL MOUNTED TELEPHONE, +48" AFF, WITH ONE RJ-11, 4-PIN CATEGORY 3 MODULAR JACK
WD	COMBINATION DATA/PHONE OUTLET BOX, WALL MOUNT, 18" AFF WITH ONE RJ-45 8-PIN CATEGORY 5e ENHANCED MODULAR JACK AND ONE RJ-11, 4 PIN CATEGORY 3 JACK
FO	FIBER OPTIC WALL CONNECTION, +48" AFF
D, M	TELEPHONE AND DATA/COMPUTER OUTLET IN COMMON BOX AND CONDUIT WHEN SHOWN TOGETHER, FLOOR MOUNTED M=MODIFIER
P	PAGING SPEAKER, CEILING OR WALL MOUNTED, WALL MOUNT AT 10'-0" AFF UON.
Ii	INSTRUMENT PPS INTERLOCK SYSTEM, WALL MTD TYPE
WP	SECURITY SET CAMERA, CCTV. WP = WEATHERPROOF
S	MAGNETIC DOOR SWITCH
R	MAGNETIC DOOR SWITCH, OVERHEAD ROLL-UP DOOR
D	MAGNETIC DOOR SWITCH, DOUBLE DOOR
A	ALARMED PANIC BAR, DOOR, WITH POWER SUPPLY
	CARD READER, PROXIMITY TYPE
C	CHIPMUNKS DEVICE, WALL MTD TYPE
CR	CARD READER, NIC, CONDUIT ONLY.
DX	PPS INTERLOCK DOOR-EMERGENCY EXIT DOOR DEVICE, WALL MTD TYPE
DE	PPS INTERLOCK DOOR-SHUTTER DRIVE DOOR DEVICE, WALL MTD TYPE
ES	ELECTRIC STRIKE WITH POWER SUPPLY AND CONTROL RELAY AS REQUIRED
P	PAGING HORN, WALL MOUNTED
R	RADIATION DETECTOR-WALL MTD TYPE WITH LOCAL LTS AND HORN
V	PAGING SPEAKER VOLUME CONTROL DIAL WALL MOUNTED

GROUNDING

Symbol	Description
L	LIGHTNING CONDUCTOR, 28 STRANDS #14 GA BC.
G	GROUND CONDUCTOR, #4/0 BC, 24" BELOW GRADE, UON. WHERE INSULATED CONDUCTOR IS INDICATED, INSULATION COLOR SHALL BE SOLID GREEN
G	GROUND PLATE- FLUSH MOUNTED IN CONCRETE FLOOR.
MG	MACHINE GROUND (CONTINUOUS 1/4" X 1 1/2" GROUND BAR IN TUNNEL).
IG/L	INSTRUMENT GROUND EXTRA LOW LEVEL SIGNAL (#2 INSULATED GROUND CONDUCTOR ROUTED IN S/ELL TRAY)
IG/N	INSTRUMENT GROUND NORMAL LOW LEVEL SIGNAL (#2 INSULATED GROUND CONDUCTOR ROUTED IN S/NLL TRAY)
	EXOTHERMIC GROUND CONNECTION
	GROUND ROD
	GROUND ROD WITH TEST WELL
	AIR TERMINAL / PREMIUM DIE CAST POINT BASE FOR ADHESIVE MTG. ON FLAT ROOFS
	GROUND PLATE - EMBEDDED IN CONC. WALL
	GROUND BAR - SURFACE MTD
	PIGTAIL - 5' LONG, FOR FUTURE GROUND CONNECTION.
	GROUND CABLE TO BUILDING STEEL COLUMN.
	AIR TERMINAL/CABLE FOR SIDE MTG. AT PARAPET
DN, G	GROUND CONDUCTOR - DOWN TO NEXT LEVEL FOR CONTINUATION
UP, G	GROUND CONDUCTOR - UP TO NEXT LEVEL FOR CONTINUATION

LIGHTING

Symbol	Description
A	LIGHTING FIXTURE DESIGNATION, FIXTURE TYPE AND MOUNTING HEIGHTS AS SHOWN ON FIXTURE SCHEDULE DWG'S: E9.30.01 & E9.30.02 UON.
	INDUSTRIAL FLUORESCENT FIXTURE, PENDENT MOUNTED
	PENDENT MOUNTED INDUSTRIAL FLUORESCENT FIXTURE WITH EMERGENCY GENERATOR FEED
a,b OR a,b	FLUORESCENT FIXTURE, CEILING OR PENDANT MOUNTED, a AND b INDICATES SWITCH CONTROL.
	CEILING OR PENDANT MOUNTED FIXTURE WITH EMERGENCY GENERATOR FEED
	FLUORESCENT FIXTURE, WALL MOUNTED
	WALL MOUNTED FIXTURE WITH EMERGENCY GENERATOR FEED
	CEILING MOUNTED FIXTURE WITH EMERGENCY GENERATOR FEED
	HID LUMINAIRE SURFACE OR WALL MOUNTED
	SURFACE OR WALL MOUNTED HID FIXTURE WITH EMERGENCY GENERATOR FEED
	CEILING AND WALL MOUNTED EXIT SIGNS. ARROW (IF USED) INDICATES DIRECTION OF EXIT. FILLED QUADRANTS INDICATE DISPLAY FACE/S.
	CEILING, PENDANT OR WALL MOUNTED FLUORESCENT OR HID FIXTURE
	CEILING OR WALL MOUNTED FIXTURE WITH EMERGENCY GENERATOR FEED
$	OCCUPANCY SENSOR WITH INTEGRAL TOGGLE SWITCH
	EMERGENCY FIXTURE WITH TWO LAMPS AND MAINTENANCE FREE SEALED BATTERY.

TRAY DESIGNATIONS

Symbol	Description
COM	TELEPHONE, DATA, PAGING, ENVIRONMENTAL CONTROLS WIRING

ABBREVIATIONS

A	AMPS
APPX	APPROXIMATELY
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AF	AMP FRAME
AT	AMP TRIP
AWG	AMERICAN WIRE GAUGE
ATS	AUTOMATIC TRANSFER SWITCH
BC	BARE COPPER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CI	CONTRACTOR INSTALLED
CM	CONSTRUCTION MANAGER
CMFE	CONSTRUCTION MANAGER FURNISHED EQUIPMENT
CMFE/CI	CONSTRUCTION MANAGER FURNISHED EQUIPMENT, CONTRACTOR INSTALLED.
CMU	CUSTOMER METERING UNIT
CO	CONDUIT ONLY
CONT	CONTROL
CPT	CONTROLS POTENTIAL TRANSFORMER
CR	CLEAN ROOM
CT	CURRENT TRANSFORMER
CU	COPPER (CABLE)
COMM, COM	COMMUNICATIONS
CPB	COMMUNICATIONS PULL BOX
CTR	CENTER
DET	DETAIL
DIST	DISTRIBUTION
DP	DISTRIBUTION PANEL
DN	DOWN
DS	DISCONNECT SWITCH
DWG	DRAWING
(E)	EXISTING
EA	EACH
ECB	ENCLOSED CIRCUIT BREAKER
EMH	ELECTRICAL MANHOLE
EMI	ELECTRO-MAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
EP	EXPLOSION PROOF
EXT	EXTERIOR
FACP	FIRE ALARM CONTROL PANEL
FU	FUSE
FL	FLUORESCENT
FA	FIRE ALARM
FLA	FULL LOAD AMPERES
FO	FIBER OPTIC (CABLE)
FVNR	FULL VOLTAGE NON REVERSING (STARTER)
GEN	GENERATOR
GFE	GOVERNMENT FURNISH EQUIPMENT, GOVERNMENT INSTALLED.
GFE/CI	GOVERNMENT FURNISH EQUIPMENT, CONTRACTOR INSTALLED.
GFI	GROUND FAULT INTERRUPTER
GND,G	GROUND
HID	HIGH-INTENSITY DISCHARGE
H-O-A	HAND-OFF-AUTO CONTROLLER
HH	HANDHOLE
HIT	HIGH INTENSITY TUNGSTEN LAMP
HP	HORSEPOWER
HPS	HIGH-PRESSURE SODIUM
HZ	HERTZ
INST	INSTRUMENTATION
JB	JUNCTION BOX
IDF	INTERMEDIATE DISTRIBUTION FRAME
IMC	INTERMEDIATE METALLIC CONDUIT
KVA	KILOVOLT AMPS
Kcmil	THOUSAND CIRCULAR MILS (CONDUCTOR SIZE)
LTCT	LIGHTING CONTACTOR
LVL	LEVEL
LTG	LIGHTING
M	METER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDF	MAIN DISTRIBUTION FRAME
MH	MANHOLE
MEZZ	MEZZANINE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MS	MOTOR STARTER
MTD	MOUNTED
N	NEUTRAL
NIC	NOT IN CONTRACT
NF	NON-FUSED
N/P	NAME PLATE
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTDOOR
OH	OVERHEAD
OS & Y	OPEN STEM & YOKE VALVE
ø, P, PH	PHASE
P	POLE
PNL	PANEL
PA	PUBLIC ADDRESS (PAGING SYSTEM)
PIV	POST INDICATING VALVE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PSC	PHONE SYSTEM CABINET
PT	POTENTIAL TRANSFORMER
PPS	PERSONNEL PROTECTION SYSTEM
PVC	POLYVINYLCHLORIDE CONDUIT
PW	PULL WIRE
PWR	POWER
RECP	RECEPTACLE
RSC	RIGID STEEL CONDUIT
RSG	RIGID STEEL GALVANIZED CONDUIT
SBC	STRANDED BARE COPPER
SECP	SECURITY CONTROL PANEL
SHT	SHEET
SUB	SUBSTATION
SIM	SIMILAR
SWBD	SWITCHBOARD
SW	SWITCH
S/NLL	SIGNAL LOW LEVEL (CABLE)
SP	SPARE
SQ	SQUARE
SWGR/SG	SWITCHGEAR
TB	TERMINAL BOARD
TEL	TELEPHONE
TMH	TELEPHONE MANHOLE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
V	VOLT
VA	VOLTAMPERE
VFD	VARIABLE FREQUENCY DRIVE
KV	THOUSAND VOLTS
KVA	THOUSAND VOLTAMPERE
KW	KILO WATTS
W	WATTS OR WIRE
WP	WEATHERPROOF DEVICE OR ENCLOSURE, NEMA 3R
W/	WITH
XFMR	TRANSFORMER
Z	IMPEDANCE

GENERAL NOTES

1. ALL ELECTRICAL WORK ON THIS PROJECT SHALL COMPLY WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE.
2. FIELD PAINT EXPOSED CONDUIT, WIREWAYS, PANEL BOX AND TRIM IN FINISHED AREAS. MATCH COLOR OF ADJACENT FINISHES.
3. CONTRACTOR SHALL VERIFY EXACT LOCATION OF EQUIPMENT WITH ARCHITECTURAL AND MECHANICAL DRAWINGS PRIOR TO ROUGH-IN.
4. CONDUCTOR SIZES ARE BASED ON 75°C AMPACITY RATING. 80°C AMPACITY SHALL BE USED FOR ALL CIRCUITS HAVING OVERCURRENT PROTECTION OF 100 AMPS OR LESS.
5. ELECTRICAL SYSTEM INSTALLATIONS EXCEEDING 600V LINE-TO-LINE SHALL COMPLY WITH ARTICLE 710 OF NFPA 70 (1996).
6. ALL EQUIPMENT ENCLOSURES LOCATED OUTSIDE THE BUILDING SHALL BE RATED NEMA 3R UNLESS OTHERWISE INDICATED.
7. FURNISH AND INSTALL SLEEVES FOR ALL CONDUIT PENETRATIONS OF CONCRETE FLOORS AND WALLS PRIOR TO CONSTRUCTION OF SAME. CONTRACTOR SHALL ALSO MAINTAIN FIRE RATING OF SAME.
8. PROVIDE PULL ROPES IN ALL CONDUIT WITHOUT CONDUCTORS. LEAVE 18" OF SLACK ON EACH END AND IDENTIFY WITH TAGS.
9. ALL #12 CONDUCTORS OVER 75' IN LENGTH FOR 120V, AND 150' IN LENGTH FOR 277V, SHALL BE INCREASED TO #10.
10. PENETRATIONS OF FIRE-RESISTIVE WALLS, FLOORS, CEILINGS AND ROOF SHALL BE PROTECTED AS REQUIRED IN U.B.C. SECTION 708. STEEL ELECTRICAL OUTLET BOXES AT OCCUPANCY SEPARATION WALLS SHALL NOT EXCEED SIXTEEN SQUARE INCHES AND SHALL NOT EXCEED ONE HUNDRED SQUARE FEET OF WALL WALL. BOXES SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES WHEN ON OPPOSITE SIDES OF WALL.
11. A GROUND WIRE SHALL BE REQUIRED IN ALL CONDUIT RUNS.
12. ALL CABLE TRAY SHALL BE GROUNDED AS REQUIRED FOR CONDUCTOR ENCLOSURES IN ARTICLE 250 OF THE NEC.
13. BRANCH CIRCUIT LOADING:
    A. GENERAL 20A, 120V CONVENIENCE OR MAINTENANCE RECEPTACLE CIRCUITS SHALL HAVE A MAXIMUM OF (5) OUTLETS PER 20A, 120V BRANCH CIRCUIT. STAGGER CIRCUITS SO ADJOINING RECEPTACLES ARE NOT ON THE SAME BRANCH CIRCUIT.
    B. 20A, 120V RECEPTACLES DEDICATED FOR PERSONAL COMPUTERS OR OTHER DATA PROCESSING EQUIPMENT SHALL HAVE A MAXIMUM OF (3) OUTLETS PER 20A, 120V BRANCH CIRCUIT. STAGGER CONDUITS SO ADJOINING RECEPTACLES ARE NOT ON THE SAME BRANCH CIRCUIT. RUN #10 FOR NEUTRAL CONDUCTOR.
    C. 20A BRANCH CIRCUIT FOR LIGHTING SHALL HAVE A MAXIMUM OF 16 AMPS PER CIRCUIT, UNLESS OTHERWISE INDICATED.
14. MOUNTING HEIGHTS ARE CENTER OF BOX, UNLESS OTHERWISE INDICATED. WHERE BACK BOXES OF DIFFERENT SIZES ARE USED AND MOUNTED NEXT TO EACH OTHER OR ON THE SAME WALL, USE A COMMON CENTER LINE.

ITEM	INCHES
RECEPTACLES	18
SWITCHES, TO TOP	48
MOTOR STARTERS, TO TOP	72
DISCONNECTS, TO TOP	72
PANELS, TO TOP	72
CABINETS, TO TOP	72
JUNCTION BOXES	15 MIN.
THERMOSTAT	48
CRT/PRINTER OUTLET, TO TOP	18
WALL MOUNTED SPEAKER	84
TELEPHONE/DATA OUTLET	18
WALL MOUNTED TELEPHONE OUTLET	48
EXIT SIGNS WALL MOUNTED	90

15. FURNISH AND INSTALL SYSTEMS, UNITS, EQUIPMENT AND PARTS TO MEET OR EXCEED CURRENT APPLICABLE REQUIREMENTS FOR SEISMIC RESISTANCE SPECIFIED BY CODES, REGULATIONS OR AGENCIES HAVING JURISDICTION. INCLUDE ALL SUPPORTS, ANCHORS, BRACE AND OTHER RESTRAINING DEVICES REQUIRED. ALL SEISMIC RESTRAINTS SHALL MEET SEISMIC ZONE 2A REQUIREMENTS OF STANDARD BUILDING CODES AND ARE THE RESPONSIBILITY OF THE CONTRACTOR. SEISMIC JOINTS HAVE 6" MOVEMENT IN ALL DIRECTIONS AT INTERCONNECT AND 4" MOVEMENT AT ALL OTHER LOCATIONS.
16. PROVIDE 120V POWER CONNECTION FROM CLOSEST RECEPTACLE TO MAGNETIC DOOR HOLDERS AND DOOR POWER SUPPLIES. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR LOCATIONS. PROVIDE FOR FIRE ALARM SYSTEM RELAY TO BE WIRED INTO CIRCUIT.
17. SOME SYMBOLS SHOWN IN SYMBOL LIST MAY NOT BE USED ON DRAWINGS.
18. ALL CB'S USED FOR LIGHT SWITCHING MUST BE U.L. LISTED AS "SWD" TYPE.

KEY NOTES

N001 ENERGYMONITORING EQUIPMENT WILL BE PROCURED UNDER SNS SUBSTATION CONTRACT. SEE CM FOR DETAILS.

N002 PROVIDE LINE FILTER ON VFD'S WITH ONE-WAY CIRCUIT LENGTH OF 100 FT OR MORE.

EQUIPMENT NAMING CONVENTION FOR CNMS-ELECTRICAL

THE FORMAT IS: CC - XBBLY
WHERE CC - IS THE BUILDING FOR EQUIPMENT LOCATION
X - IS THE SUBSTATION NUMBER
BB - IS THE EQUIPMENT TYPE
L - IS THE FLOOR LABEL
Y - IS THE EQUIPMENT SEQUENCE NUMBER

EQUIPMENT TYPE	bb CODES
POWER PANEL, 480V, 3 PH, 3 W	P
LIGHTING & POWER PANEL 480/277 V, 3 PH, 4 W	L OR LP
PANEL 208/120 V, 3 PH, 4W	PP
DISTRIBUTION PANEL 480V, 480/277 V, 208/120 V, 3 PH 3W & 3 PH 4W	DP
EMERGENCY POWER PANEL 480V, 3 PH, 3W	EP
EMERGENCY LIGHTING & POWER PANEL 480/277 V, 3 PH, 4W	EL
EMERGENCY PANEL 208/120 V, 3 PH, 4W	EPP
EMERGENCY DISTRIBUTION PANEL	EDP
TRANSFORMER	T
EMERGENCY GENERATOR	EG
AUTOMATIC TRANSFER SWITCH	ATS
UNIT SUBSTATION	SS
SWITCH GEAR	SG
MOTOR CONTROL CENTER	MCC
UNINTERRUPTIBLE POWER SUPPLY	UPS
UNINTERRUPTIBLE EMERGENENCY PANEL	UEP
LIGHTING CONTACTOR	LC
VARIABLE FREQUENCY DRIVE	VFD
FAN FILTER UNIT	FFU

BUILDING NAME	cc CODES
CENTER FOR NANOPHASE MATERIAL SSCIENCES	CNMS

EQUIPMENT CALL OUT ON DRAWINGS:

CN - 1 DP B 1
- 1 (last) — EQUIP. SEQUENCE #
- B — FLOOR LEVEL
- DP — bb CODES
- 1 — UNIT SUBSTATION #
- CN — cc CODES

SECTION AND DETAIL KEY: NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM ______
ENGINEERING PROCEDURE ______

P:\ORNL\LS0230.01-CNMS-Titlel-II\0700-cadd\0726-electrical\E0-01-41.dwg @ 1/20/03 - 4:34pm
AutoCAD

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE
0				CERTFIED FOR CONSTRUCTION 12/9/02	CR	VGS				01/03		1/03		1/03			VGS	106009	

REVISION OR ISSUE PURPOSE — REVISION APPROVALS

SQUAD CHECK

ST	CV	EC	EE	EM	IE	M	PD	SE	AR
RZ	AW	BWJ	AK	IM	DM	–	BWJ	–	TW

RPE — REV. 0 DATE 12/9/02 — DRAWING APPROVALS

DSN	C. RUNNG		12/09/02
DRW	L. MAKOVSKY		12/09/02
CHK	V. STEFFEN		12/09/02
DEPT			
PE	CLG		01/24/03
PJ	JS		1/23/03
REQ			1/24/03
UTB			

VICTOR G. STEFFEN REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 00106009 — STATE OF TENNESSEE — 1-22-03

ORNL DRAWING NUMBER:

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PROJECT NAME:
CENTER FOR NANOPHASE MATERIALS SCIENCES
SYMBOLS, ABBREVIATIONS, GENERAL NOTES

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